Lithologic Log Addendum

Well ST-1-630

Cuttings of the lithologic unit from well ST-1-630 were sent to the Department of Geological Sciences, New Mexico State University (NMSU), Las Cruces, New Mexico, for detailed petrographic analysis when identification of fine-grained, highly altered volcanic rocks at the NASA-WSTF site became difficult using conventional field methods. Petrographic reports from NMSU were received after the printing of these lithologic logs, hence the need for this addendum. The petrographic description from NMSU is included below.

Previous unit name based on field identification: **Tuff**

New Unit name based on petrographic analysis: **Andesite**

ST-1-630 (695' - 700')

Porphyritic biotite-augite andesite

Origin:	lava flow
Texture:	aphanitic porphyritic
Phenocryst mineralogy:	plagioclase + augite + biotite + FeTi oxides
Porosity:	low in rock but potentially high along calcite veins
Alteration:	thick veins of calcite are present, but otherwise fresh

Approximately 7% phenocrysts are surrounded by an intersertal to trachytic groundmass dominated by plagioclase and oxides. Plagioclase phenocrysts (3%, 0.1 - 1.4 mm) are zoned and resorbed, with euhedral clear rims. Augite phenocrysts (3%, 0.34 - 1.4 mm) are twinned and euhedral. Biotite phenocrysts (0.5%, 1 - 1.4 mm) are oxidized and exhibit yellow to red-brown pleochroism. FeTi oxides (0.5%, 0.3 - 0.45 mm) are present as microphenocrysts. Apatite (0.1 mm) exists in trace amounts within augite and plagioclase phenocrysts. A trace of quartz is present, in contact with augite, and is rounded and embayed. The porosity is low in the unfractured rock, but is potentially quite high along the veins. Alteration is mainly present in thick veins of clear calcite that contain fragments of phenocryst crystals and groundmass. The veins are 0.1 mm to 0.4 mm wide. Other than the veins, the rock is fairly fresh. This sample originated as a lava flow.